Montana Department of
ENVIRONMENTAL QUALITY
Brian Schweitzer, Governor
P. O. Box 200901 Helena, MT 59620-0901 (406) 444-2544 Website: www.deq.mt.gov

PRELIMINARY DETERMINATION
ON PERMIT APPLICATION

Date of Mailing: January 5, 2008

Name of Applicant: Montana Dakota Utilities Co. – Lewis and Clark Station

Source: Electric Power Generation

Proposed Action: The Department of Environmental Quality (Department) proposes to issue a permit, with conditions, to the above-named applicant. The application was assigned Permit Application Number 0691-00.

Proposed Conditions: See attached.

Public Comment: Any member of the public desiring to comment must submit such comments in writing to the Air Resources Management Bureau (Bureau) of the Department at the above address. Comments may address the Department's analysis and determination, or the information submitted in the application. In order to be considered, comments on this Preliminary Determination are due by February 4, 2009. Copies of the application and the Department's analysis may be inspected at the Bureau's office in Helena. For more information, you may contact the Department.

Departmental Action: The Department intends to make a decision on the application after expiration of the Public Comment period described above. A copy of the decision may be obtained at the above address. The permit shall become final on the date stated in the Department's Decision on this permit, unless an appeal is filed with the Board of Environmental Review (Board).

Procedures for Appeal: Any person jointly or severally adversely affected by the final action may request a hearing before the Board. Any appeal must be filed by the date stated in the Department's Decision on this permit. The request for a hearing shall contain an affidavit setting forth the grounds for the request. Any hearing will be held under the provisions of the Montana Administrative Procedures Act. Submit requests for a hearing in triplicate to: Chairman, Board of Environmental Review, P.O. Box 200901, Helena, MT 59620.

For the Department,

Vickie Walsh
Air Permitting Program Supervisor
Air Resources Management Bureau
(406) 444-3490

Trista Glazier
Environmental Science Specialist
Air Resources Management Bureau
(406) 444-3403

VW:TG
Enclosures

MONTANA AIR QUALITY PERMIT

Issued To:	Montana Dakota Utilities Lewis and Clark Station P.O. Box 1145 Sidney, MT 59270	Permit: #0691-00 Application Complete: 11/26/08 Preliminary Determination Issued: 1/05/09 Department's Decision Issued: Permit Final: AFS #:083-0003

An air quality permit, with conditions, is hereby granted to Montana Dakota Utilities Co. (MDU), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

SECTION I: Permitted Facilities

A. Permitted Equipment

MDU operates a tangential coal-fired boiler (Unit 1) capable of burning coal or natural gas and associated equipment for generation of electricity. Unit 1 and associated equipment are not required to have a Montana Air Quality Permit (MAQP) as defined in ARM 17.8.743. Unit 1 was in operation before November 23, 1968, and has not undergone modification resulting in an increase of the potential to emit of more than 25 tons per year (tpy) of any regulated airborne pollutant. However, the facility is subject to mercury emission limitations under ARM 17.8.771. MAQP #0691-00 establishes a mercury emission limit and associated operating requirements for the boiler in order to comply with ARM 17.8.771.

B. Plant Location

The MDU facility is located in the SW 1/4 of Section 9, Township 22 N, Range 59 E in Richland County, Montana. A list of the permitted equipment is located in Section I.A of the permit analysis.

SECTION II: Conditions and Limitations

A. Emission Limitations

1. MDU shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

2. MDU shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed on or before November 23, 1968, that exhibit an opacity of 40% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

3. MDU shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

4. MDU shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.2 (ARM 17.8.749).

5. Beginning January 1, 2010, MDU shall limit mercury emissions from Unit 1 to an emission rate equal to or less than 1.5 pounds mercury per trillion British thermal units (lb/TBtu), calculated as a rolling 12-month average (ARM 17.8.771).

6. MDU shall install an oxidizing agent injection (OAI) system and an activated carbon injection (ACI) system. MDU shall implement the operation and maintenance of the OAI and ACI systems on or before January 1, 2010 (ARM 17.8.771).

7. MDU shall comply with all applicable standards and limitations, and the operating, reporting, recordkeeping, and notification requirements contained in 40 CFR Part 75 (ARM 17.8.771).

B. Testing Requirements

1. Enforcement of Sections II.A.4, where applicable, shall be determined by utilizing data taken from a Mercury Emission Monitoring System (MEMS). The MEMS shall be comprised of equipment as required in 40 CFR 75.81(a) and defined in 40 CFR 72.2. The above does not relieve MDU from meeting any applicable requirements of 40 CFR Part 75. Testing requirements shall be as specified in 40 CFR Part 75, Section II.B, and II.D of MAQP #0691-00 (ARM 17.8.771).

2. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

3. The Department of Environmental Quality (Department) may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

1. MDU shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. MDU shall notify the Department of any construction or improvement project conducted, pursuant to ARM 17.8.745, that would include ***the addition of a new emissions unit,*** change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to startup or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by MDU as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

4. The owner or operator of any mercury-emitting generating unit shall report to the Department within 30 days after the end of each calendar quarter, as described in Attachment 2 (ARM 17.8.749):

   a. The monthly average lb/TBtu mercury emission rate, for each month of the quarter;

   b. The 12-month rolling average lb/TBtu emission rate for each month of the reporting quarter; and

   c. Number of operating hours that the MEMS was unavailable or not operating within quality assurance limits (monitor downtime).

5. The first quarterly report must be received by the Department by April 30, 2010, but shall not include 12-month rolling averages. The first quarterly report to include 12-month rolling averages must be received by the Department by January 30, 2011.

D. Mercury Emissions Monitoring Systems

A MEMS shall be installed, certified, and operating on the Unit 1 stack outlet on or before January 1, 2010. Said monitor shall comply with the applicable provisions of 40 CFR Part 75. The monitors shall also conform with requirements included in Attachment 2 (ARM 17.8.771).

E. Notification

Within 15 days after actual startup of the OAI and ACI systems, MDU shall notify the Department of the date of actual startup (ARM 17.8.749).

SECTION III: General Conditions

A. Inspection – MDU shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS, MEMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if MDU fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving MDU of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefor, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not

stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by MDU may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

MEMS

a. MDU shall install, calibrate, certify, maintain, and operate a MEMS to monitor and record the rate of mercury emissions discharged into the atmosphere from all mercury emitting generating units (units) as defined in the Administrative Rules of Montana 17.8.740.

(1) The MEMS shall be comprised of equipment as required in 40 CFR 75.81(a) and defined in 40 CFR 72.2.

(2) The MEMS shall conform to all applicable requirements of 40 CFR Part 75.

(3) The MEMS data will be used to demonstrate compliance with the emission limitations contained in Section II.A.4.

b. MDU shall prepare, maintain and submit a written MEMS Monitoring Plan to the Department.

(1) The monitoring plan shall contain sufficient information on the MEMS and the use of data derived from these systems to demonstrate that all the gaseous mercury stack emissions from each unit are monitored and reported.

(2) Whenever MDU makes a replacement, modification, or change in a MEMS or alternative monitoring system under 40 CFR 75 subpart E, including a change in the automated data acquisition and handling system (DAHS) or in the flue gas handling system, that affects information reported in the monitoring plan (e.g. a change to a serial number for a component of a monitoring system), then the owner or operator shall update the monitoring plan.

(3) If any monitoring plan information requires an update pursuant to Section b.(2), submission of the written monitoring plan update shall be completed prior to or concurrent with the submittal of the quarterly report required in c. below for the quarter in which the update is required.

(4) The initial submission of the Monitoring Plan to the Department shall include a copy of a written Quality Assurance/Quality Control (QA/QC) Plan as detailed in 40 CFR 75 Appendix B, Section 1. Subsequently, the QA/QC Plan need only be submitted to the Department when it is revised.

(5) The Monitoring Plan shall include, at a minimum, the following information:

(a) Facility summary including:

(i) A description of each mercury emitting generating unit at the facility.

(ii) Maximum and average loads (in megawatts (MW)) with fuels combusted and fuel flow rates at the maximum and average loads for each unit.

(iii) A description of each unit's air pollution control equipment and a description of the physical characteristics of each unit's stack.

(b) Mercury emission control summary including a description of control strategies, equipment, and design process rates.

(c) MEMS description, including:

(i) Identification and description of each monitoring component in the MEMS including manufacturer and model identifications; monitoring method descriptions; and normal operating scale and units descriptions. Descriptions of stack flow, diluent gas, and moisture monitors (if used) in the system must be described in addition to the mercury monitor or monitors.

(ii) A description of the normal operating process for each monitor including a description of all QA/QC checks

(iii) A description of the methods that will be employed to verify and maintain the accuracy and precision of the MEMS calibration equipment.

(iv) Identification and description of the DAHS, including major hardware and software components, conversion formulas, constants, factors, averaging processes, and missing data substitution procedures.

(v) A description of all initial certification and ongoing recertification tests and frequencies; as well as all accuracy auditing tests and frequencies.

(d) The Maximum Potential Concentration (MPC), Maximum Expected Concentration (MEC), span value, and range value as applicable and as defined in 40 CFR 75 Appendix A, 2.1.7.

(e) Examples of all data reports required in c. below.

c. MDU shall submit written, Quarterly Mercury Monitoring Reports. The reports shall be received by the Department within 30 days following the end of each calendar quarter, and shall include, at a minimum, the following:

(1) Mercury emissions. The reports shall include:

(a) The 12-month rolling average pounds per trillion British thermal units (lb/TBtu) emission rate for each month of the reporting quarter. The rolling 12-month basis is an average of the last 12 individual calendar monthly averages, with each monthly average calculated at the end of each calendar month;

(b) The monthly average lb/TBtu mercury emission rate for each month of the quarter;

(c) The total ounces of mercury (rounded to the nearest thousandth) emitted for:

(i) the reporting quarter; and

(ii) the calendar year to date.

(d) The total heat input to the boiler (in TBtu) for:

(i) each month of the quarter;

(ii) each 12-month rolling period of the quarter; and

(iii) the calendar year to date.

(2) Mercury excess emissions. The report shall describe the magnitude of excess mercury emissions experienced during the quarter, including:

(a) The date and time of commencement and completion of each period of excess emissions. Periods of excess emissions shall be defined as those emissions calculated on a rolling 12-month basis which are greater than the limitation established in II.A.4.

(b) The nature and cause of each period of excess emissions and the corrective action taken or preventative measures adopted in response.

(c) If no periods of excess mercury emissions were experienced during the quarter, the report shall state that information.

(3) MEMS performance. The report shall describe:

(a) The number of operating hours that the MEMS was unavailable or not operating within quality assurance limits (monitor downtime) during the reporting quarter, broken down by the following categories:

- Monitor equipment malfunctions;
- Non-Monitor equipment malfunctions;
- Quality assurance calibration;
- Other known causes; and
- Unknown causes.

(b) The percentage of unit operating time that the MEMS was unavailable or not operating within quality assurance limits (monitor downtime) during the reporting quarter. The percentage of monitor downtime in each calendar quarter shall be calculated according to the following formula:

$$MEMSDowntime\% = \left(\frac{MEMSDownHours}{OpHours} \right) x100 \quad \text{where}$$

MEMSDowntime% = Percentage of unit operating hours classified as MEMS monitor downtime during the reporting quarter

MEMSDownHours = Total number of hours of MEMS monitor downtime during the reporting quarter

OpHours = Total number of hours the unit operated during the reporting quarter.

(c) For any reporting quarter in which monitor downtime exceeds 10%, a description of each time period during which the MEMS was inoperative or operating in a manner defined in 40 CFR Part 75 as "out of control." Each description must include the date, start and end times, total downtime (in hours), the reason for the system downtime, and any necessary corrective actions that were taken. In addition, the report shall describe the values used for any periods when missing data substitution was necessary as detailed in 40 CFR 75.30, *et seq*.

(4) The quarterly report shall include the results of any QA/QC audits, checks, or tests conducted to satisfy the requirements of 40 CFR Part 75 Appendices A, B or K.

(5) Compliance certification. Each quarterly report shall contain a certification statement signed by the facility's responsible official based on reasonable inquiry of those persons with primary responsibility for ensuring that all of the unit's emissions are correctly and fully monitored. The certification shall indicate:

(a) Whether the monitoring data submitted were recorded in accordance with the applicable requirements of 40 CFR Part 75 including the QA/QC procedures and specifications of that part and its appendices, and any such requirements, procedures and specifications of an applicable excepted or approved alternative monitoring method as represented in the approved Monitoring Plan.

(b) That for all hours where data are substituted in accordance with 40 CFR 75.38, the add-on mercury emission controls were operating within the range of parameters listed in the quality-assurance plan for the unit, and that the substitute values do not systematically underestimate mercury emissions.

(6) The format of each component of the quarterly report may be negotiated with the Department's representative to accommodate the capabilities and formats of the facility's DAHS.

(7) Each quarterly report must be received by the Department within 30 days following the end of each calendar reporting period (January-March, April-June, July-September, and October-December).

d. MDU shall maintain a file of all measurements and performance testing results from the MEMS; all MEMS performance evaluations; all MEMS or monitoring device calibration checks and audits; and records of all adjustments and maintenance performed on these systems or devices recorded in a permanent form suitable for inspection. The file shall be retained on site for at least five years following the date of such measurements and reports. MDU shall make these records available for inspection by the Department and shall supply these records to the Department upon request.

Permit Analysis
Montana Dakota Utilities Co. Lewis and Clark Station
Permit #0691-00

I. Introduction/Process Description

Montana Dakota Utilities Co. Lewis and Clark Station (MDU) owns and operates a tangential coal-fired boiler (Unit 1) capable of burning coal or natural gas and associated equipment for generation of electricity. The facility is located in the SW 1/4 of Section 9, Township 22 N, Range 59 E in Richland County, Montana.

A. Permitted Equipment

Permit #0691-00 applies to operation of a mercury emission control system which consists of:

- An oxidizing agent injection (OAI) system to be operated in conjunction with an activated carbon injection (ACI) system; and,
- A Mercury Emission Monitoring System (MEMS)

B. Source Description

Coal is shipped to MDU, unloaded, stored in stockpiles, and delivered to plant storage silos by conveyor. Coal stored in storage silos at MDU is conveyed to three coal feeders. The coal is fed to three pulverizers, from which the coal is carried to Unit 1 in a preheated stream of air. The boiler exhaust gas passes through air heaters for heat transfer and then through mechanical dust collectors (multi-cyclone) to capture the large particulate material. The flue gas is then directed to a wet scrubber for control of particulate matter (PM) and sulfur dioxide (SO_2). Solids collected from the multi-cyclone are pneumatically conveyed to an ash storage silo. The scrubber slurry is sluiced to a storage pond for settling and recycling of the sluice water.

The oxidizing agent injection system will be integrated either into MDU's coal feeders or between the Unit 1 boiler and the wet scrubber. Delivery of the oxidizing agent will be by truck and storage will be indoors in totes or similar storage containers. The oxidizing agent will be pumped either to a dosing system at the coal feeders and applied to the coal by drip tubes, or to an injection system in the ductwork after the boiler and before the wet scrubber and sprayed into the exhaust gas stream.

The activated carbon injection system will be installed between the Unit 1 boiler and the wet scrubber. Activated carbon will be delivered by truck, pneumatically unloaded, and stored in a new activated carbon silo constructed on-site. The bin vent on the silo will be controlled by a fabric filter. The activated carbon will be injected pneumatically into lances for distribution within the exhaust gas stream.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   MDU shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

   MDU must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. (1) This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed on or before November 23, 1968, that exhibit an opacity of 40% or greater averaged over 6 consecutive minutes (ARM 17.8.304). (2) This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, MDU shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.

6. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. (4) Commencing July 1, 1972, no person shall burn liquid or solid fuels containing sulfur in excess of 1 pound of sulfur per million Btu fired. (5) Commencing July 1, 1971, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions.

7. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

D. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. MDU submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

E. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. MDU was in operation before November 23, 1968 and has not undergone

modification resulting in an increase of the potential to emit of more than 25 tons per year (tpy) of any regulated airborne pollutant and therefore does not meet the requirements for a Montana Air Quality Permit (MAQP) as defined in ARM 17.8.743. However, MDU was required to submit a MAQP application pursuant to ARM 17.8.771.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. MDU submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. MDU submitted an affidavit of publication of public notice for the November 16, 2008, issue of the *Sidney Herald*, a newspaper of general circulation in the Town of Sidney in Richland County, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving MDU of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.

15. ARM 17.8.771 Mercury Emission Standards for Mercury-Emitting Generating Units. This rule identifies mercury emission limitation requirements, mercury control strategy requirements, and application requirements for mercury-emitting generating units.

F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is a listed source and has the PTE 100 tpy or more of pollutants subject to regulation under the FCAA ; therefore, the facility is major. This modification will not cause a net emission increase greater than significant levels and, therefore, does not require a New Source Review (NSR) analysis. The net emission changes are as follows:

An increase in PM and PM_{10} emissions will result from the proposed project. The increase in emission will result from the installation of an activated carbon silo, a related increase from the boiler stack, and a related increase of haul road truck traffic. The emissions increase resulting from the proposed project is summarized in the following table.

	PM (tpy)	**PM_{10} (tpy)**
Activated Carbon Silo	0.19	0.19
Boiler	9.86	6.66
Haul Road Truck Traffic	0.02	0.00
Total Emission Increase	**10.07**	**6.85**

G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. PTE > 100 tons/year of any pollutant;

   b. PTE > 10 tons/year of any one hazardous air pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tons/year of particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #0691-00 for MDU, the following conclusions were made:

   a. The facility's PTE is greater than 100 tons/year for any pollutant.

   b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.

   c. This source is not located in a serious PM_{10} nonattainment area.

   d. This facility is not subject to a current NSPS.

   e. This facility is subject to current NESHAP standards (40 CFR 63 Subpart DDDDD and 40 CFR 63 Subpart CCCCCC).

   f. This source is a Title IV affected source, but not a solid waste combustion unit.

   g. This source is not an EPA designated Title V source.

   Based on these facts, the Department determined that MDU is subject to the Title V operating permit program. MDU's Title V Operating Permit will be modified to reflect the conditions associated with this permit action.

III. BACT Determination

A BACT determination is required for each new or altered source. MDU shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was not required for the current permit action because the MDU is not proposing to install or operate a new or modified emitting unit.

IV. Mercury Control Technology Analysis

Per ARM 17.8.771, an analysis was submitted by MDU in permit application #0691-00, addressing available methods of controlling mercury emissions from Unit 1. This analysis also included the proposed mercury emission control strategy projected to achieve compliance with the 1.5 pounds per trillion British thermal unit (lb/TBtu) emission limit established in this permit.

A. Mercury Control Technologies Considered

Pursuant to ARM 17.8.771(1)(c), MDU considered mercury emission control technologies (sorbent injection, oxidizing agent injection, and scrubber additives) and boiler technologies (oxidizing agents applied to the coal and multipollutant control strategies) to comply with the mercury emission limit. Mercury is defined in ARM 17.8.740 as "mercury or mercury compounds in either a gaseous or particulate form." In the gaseous form, mercury is in the elemental or the oxidized (ionic) form. Mercury is present in coal in trace amounts in various forms and is released during combustion as elemental mercury vapor. This elemental mercury vapor may then be oxidized by chlorine compounds present in the gas stream. Since lignite typically has low chlorine content, a majority of mercury emissions from lignite combustion are in the elemental vapor-phase form, which is not captured using common particulate control devices (i.e. multi-cyclone, wet scrubbers). A small fraction of mercury emissions from coal combustion are in the ionic, vapor-phase form, which can be captured using common particulate control devices. Very low mercury emissions from coal combustion are in the particulate phase (i.e. in the fly ash), which can also be captured using common particulate control devices. As such, MDU focused on either capturing the elemental mercury, or converting the elemental mercury to ionic or particulate mercury for capture in its particulate control devices. The technologies considered by MDU included sorbent injection, utilization of oxidizing agents, use of scrubber additives, and multipollutant controls.

1. Sorbent Injection

Sorbent injection introduces a sorbent into the process exhaust gas stream, where it adsorbs elemental and ionic vapor-phase mercury from the flue gas. The sorbent particles are later captured with the mercury in a particulate control device. Common sorbents injected include activated carbon, chemically treated (impregnated) carbon, and non-carbon based sorbents such as calcium or clay. Fixed beds containing activated carbon were also considered, but they are not commercially demonstrated at this scale.

MDU focused on activated carbon. MDU evaluated activated carbon injection with both unmodified and oxidizing agent impregnated activated carbon during multiple tests. During testing performed by the Energy and Environmental Research Center (EERC) at the facility in 2007, activated carbon was injected downstream of the multi-cyclone. During more recent independent testing at the facility in 2008, activated carbon was injected upstream of the multi-cyclone. Refer to Section IV.C for results of these tests.

2. Oxidizing Agents

Oxidizing agents convert elemental mercury to ionic mercury through an oxidation reaction. Oxidizing agents are typically halogens or other strong oxidants such as ozone or permanganates. These agents work in the same manner as chlorine, naturally present in higher-grade coals, to oxidize the mercury following combustion. The ionic mercury can then be captured in common particulate control devices (i.e. the wet scrubber). Oxidizing agents can be applied to the coal in the feeder system to be released with the elemental mercury during combustion, or to the flue gas stream after the boiler. Oxidizing agent injection technology can be used in conjunction with other technologies such as activated carbon injection; in this case the ionic mercury is adsorbed onto carbon particles and is then captured in the particulate control device. Three oxidizing agents were evaluated. Refer to Section IV.C for results of these tests.

3. Scrubber Additive

Chemical additives can be introduced into the wet scrubber liquor to enhance mercury removal. The purpose of the additive is to limit chemical reduction of ionic mercury to elemental mercury already captured by the wet scrubber. Chemical reduction typically occurs by reaction with aqueous sulfite and/or bisulfite species in solution because of SO_2 absorption. If reduction occurs, elemental mercury is not soluble and is re-emitted into the exhaust gases. MDU performed testing of a proprietary scrubber additive technology. A scrubber additive was injected into the wet scrubber liquor to enhance mercury capture from the flue gas and prevent elemental mercury re-emissions. The scrubber additive "fixes" both elemental and oxidized mercury by chemical reaction.

4. Multipollutant Controls

Multipollutant control strategies are available to reduce emissions of SO_2 and/or nitrogen oxides (NO_x) in addition to mercury. Some of these strategies are based on the mercury emission control technologies described above (sorbent injection and/or oxidizing agents), while installing low NO_x burners with over-fired air systems and flue gas desulfurization for NO_x and SO_2 control, respectively. Others use injection of urea as an oxidizing agent for both NO_x and mercury control, and either sorbent injection or flue gas desulfurization for SO_2 control. An example of a multipollutant control strategy considered is APTECH technology. APTECH involves using flue gas recirculation with limestone slurry/urea injection for NO_x and SO_2 control and activated carbon along with the installation of a baghouse for mercury control.

B. Viability of Mercury Control Technologies

The viability of each considered mercury control technology is considered below. MDU determined the viability of the mercury control technologies considered based on whether the technology met the following criteria:

- Licensing is available for the selected technology,
- The selected technology has been commercially demonstrated to achieve the 1.5 lb/TBtu mercury emission limit, as measured by a CMMS,
- The technology can be installed by the January 1, 2010 compliance date and operated in conjunction with Unit 1, and
- There are no disproportionate negative effects on other pollutants as a result of the selected technology.

1. Sorbent Injection

MDU demonstrated the use of sorbent injection, particularly activated carbon, to be a viable technology. The technology was not demonstrated by MDU to achieve the 1.5 lb/TBtu mercury emission limit by itself; however, it can be applied in conjunction with other mercury emission control technologies to achieve the 1.5 lb/TBtu emission limit. MDU also believes it can install this technology by the compliance date.

MDU currently operates a multi-cyclone to capture the large particulate material and a wet scrubber for SO_2 and particulate control. MDU projected that sorbent injection with the current particulate controls will achieve compliance with the requested mercury emission

limit, as described later in Section IV.D. Therefore, MDU does not believe it is necessary to install additional particulate control equipment to enhance removal with sorbent injection technologies. Since sorbent injection has been demonstrated at other facilities in conjunction with fabric filter or electrostatic precipitator particulate control technologies, MDU performed a review to determine if installation of additional particulate controls is a viable option.

MDU received proposals from multiple vendors to furnish a pulse jet type baghouse with oxidizing agent and activated carbon injection. Due to current engineering, material purchase, fabrication and delivery lead times associated with the baghouse equipment, as well as the required field erection labor, our consulting engineer and the baghouse vendors have indicated that commercial operation can not be achieved by January 1, 2010. Coupled with the associated need to modify existing ductwork, upgrade/replace both the ID fan and its motor drive, and modify the station ash handling system to support a baghouse, a baghouse could not be operational at MDU until the third quarter of 2010 or later. The use of a baghouse with oxidizing agent and activated carbon injection for mercury emission control is, therefore, not viable for purposes of the compliance strategy.

Installation of a baghouse was not economically defensible. Installation of a baghouse to enhance particulate capture and mercury removal in addition to the oxidizing agent and activated carbon injection systems is estimated to increase the annualized mercury removal costs by a factor of three, with a corresponding impact on retail electric rates, compared to installing the proposed oxidizing agent and activated carbon injection systems alone.

MDU calculated mercury emissions removal costs based on recent cost data from vendors. The estimated cost of removing mercury using an activated carbon and oxidizing agent injection system with a baghouse is estimated to be $97,500/lb, compared with a cost of removal using the activated carbon and oxidizing agent injection system alone being $36,300/lb. According to vendor quotes, the capital cost of an oxidizing agent and activated carbon injection system alone is estimated to be $5 million, and when adding a baghouse the total capital cost would be $22.9 million. Further, a baghouse is expected to lower the pH in scrubbing liquor due to ash removal, thus resulting in a potential SO_2 emissions increase unless additional resources are expended to introduce more lime for SO_2 removal.

Based on these factors and given that MDU projected compliance with the mercury rule requirements using its proposed mercury emission control strategy, installation of a baghouse is not viable and is also not necessary. The baghouse is not an economically feasible control strategy for mercury emissions and it could not be installed and operating in time for compliance.

2. Oxidizing Agents

The use of oxidizing agents is a viable mercury emission control technology. This technology has not been demonstrated by Montana-Dakota to achieve the requested 1.5 lb/TBtu mercury emission limit by itself; however, it can be applied in conjunction with other mercury emission control technologies and the combination has been demonstrated through testing at MDU. Results from this testing are described in Sections IV.C.1, IV.C.2, and IV.C.3.

3. Scrubber Additive

During scrubber additive testing, mercury emissions were reduced. However, the use of the particular scrubber additive it tested is not viable at this time due to commercial licensing restrictions. MDU indicated it will continue to evaluate whether this technology becomes viable and if it should be applied at L&C Station. Scrubber additives can be used in conjunction with other mercury emission control technologies; therefore, the opportunity exists to use scrubber additives in conjunction with the proposed mercury emission control strategy. Section IV.C.2 describes the results of this testing.

4. Multipollutant Controls

For MDU, which uses low-NOx burners and flue gas desulfurization, multipollutant control strategies are not cost effective compared to strategies focused solely on mercury removal. Multipollutant control strategies typically rely on use of sorbent injection or oxidizing agents, therefore the appropriate technologies have already been considered without giving special consideration to multipollutant control strategies. Therefore, further analysis was not performed.

C. Control Effectiveness of Mercury Control Technologies

MDU evaluated the control effectiveness of the considered mercury control technologies by performing short-term, full-scale testing. Three separate tests were performed to evaluate sorbent injection, oxidizing agent injection, and scrubber additives. These tests are described in the subsections below.

1. June-July 2007 EERC Testing

In June and July 2007, the University of North Dakota Energy and Environmental Research Center (EERC) performed testing at MDU. The EERC testing investigated the use of an oxidizing agent, referred to as a sorbent enhancing additive (SEA), with activated carbon. Two types of SEA were tested at L&C Station, referred to as SEA1 (calcium chloride) and SEA2. (MDU was held to a confidentiality agreement in regards to SEA2 and did not disclose the actual chemical name). Testing indicated that SEA2 outperformed SEA1 at the facility. The EERC testing concluded that use of SEA2, with activated carbon injection has the potential to meet the requested 1.5 lb/TBtu mercury emission limit as measured by a Continuous Mercury Emission Monitoring System (CMMS).

This full-scale test included approximately two days of baseline testing, one week of parametric testing with activated carbon and oxidizing agent injection, and one week of testing to optimize injection rates. SEA1 was applied at the coal feeders, and activated carbon and SEA2 were injected downstream of the multi-cyclone. Sampling was performed at the multi-cyclone outlet and at the stack. A slipstream baghouse was connected to the process downstream of the activated carbon injection point. Ontario-Hydro testing and MEMS measurements were used to measure mercury concentrations at the stack and the baghouse inlet and outlet.

Baseline testing found that the average baseline mercury concentration in the flue gas is 12.5 micrograms per cubic meter ($\mu g/m^3$) and that there was little natural capture occurring in the wet scrubber. Approximately 88% of the mercury emitted was in the elemental form.

Parametric testing occurred over a one week period, June 17-21, 2007. The results discussed in the bullet points below reflect the percent mercury reduction at the stack as measured by a CMMS. From the testing it was determined that:

- The injection of untreated activated carbon resulted in mercury removal of 69% at an injection rate of 5 pounds per million actual cubic feet (lb/Macf),

- When SEA2 was added with activated carbon injection, mercury removal rates were greater than 90%, and

- Results of the baghouse testing indicated that mercury removal efficiencies equivalent to operations without a baghouse, as measured by a MEMS, could be achieved at lower injection rates (due to longer reaction times at the filter cake).

Two longer-term testing periods occurred over July 10-13, 2007 and July 23-25, 2007, using SEA2 as an oxidizing agent and without the use of a baghouse. During the second and optimized long-term test period, the average overall mercury removal was found to be 92.4% as measured by the CMMS. It was noted that particulate-bound mercury, as measured by Ontario-Hydro testing, increased with activated carbon injection.

The report also stated that a baghouse would be needed to achieve additional total mercury (including particulate-bound mercury) reduction; however, the EERC test report did not include consideration of other control techniques and enhancements for reducing total mercury emissions. As previously stated, the selection and subsequent installation of a baghouse will compromise the January 1, 2010, compliance time frame and add undue economic burden for relatively modest incremental mercury reductions. The EERC test report estimated the cost of compliance using an activated carbon and oxidizing agent injection system with a baghouse would be $83,000/lb, compared with a cost of compliance using the activated carbon and oxidizing agent injection system alone being $17,000/lb. The capital cost of an oxidizing agent and activated carbon injection system alone was estimated to be $1 million, and when adding a baghouse, the total capital cost was estimated to be $16 million. Additionally, the current particulate controls at MDU, in combination with the proposed mercury control strategy, are projected to meet the requested 1.5 lb/TBtu emission limit and therefore the installation of a baghouse is unnecessary.

2. June 2008 EES Testing

In June 2008, Alstom Power Environmental Control Services (ECS) and Environmental Energy Services (EES) performed testing at MDU. Although mercury emissions reductions were observed, testing did not produce conclusive results that use of an oxidizing agent, in this case calcium bromide (KNXTM), with a proprietary scrubber additive has the potential to meet the requested 1.5 lb/TBtu mercury emission limit as measured by the MEMS. Due to licensing restrictions, further testing with the scrubber additive could not be performed and therefore could not be considered a viable option for mercury removal at this time. Scrubber additive technology could be considered in the future pending commercialization of the additive.

This full-scale test included baseline testing and 36 hours of varying injection rates of KNX and the scrubber additive. The KNX technology involves the process of applying a bromine containing chemical to the coal prior to the combustion process to enhance mercury oxidation. KNX was applied at the coal feeders, and scrubber additive was injected into the scrubber liquor. CMMS measurements were used to measure mercury

concentrations at the stack. Because of licensing and confidentiality concerns, a report is not included with this application, and no specific scrubber additive injection rates are discussed.

The preliminary test results indicated the following:

- Baseline stack emission rates were approximately 11.8 micrograms per normal cubic meter (µg/Nm3) during the initial portion of the test and approximately 9.9 µg/Nm3 during the later portions of the test.
- With KNX injection alone the average mercury stack emissions were reduced by approximately 25%.
- The maximum mercury removal was found to be approximately 78%. During the highest injection rates nearly 100% of the mercury was oxidized from its elemental state to ionic mercury.
- The requested mercury emission limit for MDU was not achieved during the June 2008 EES testing.

3. July-August 2008 EES Testing

In July 2008, EES and the EERC performed testing at MDU. While burning poor quality coal, testing concluded that use of an oxidizing agent (450 ppm KNX) with activated carbon injection (2 to 4 lb/Macf) has the potential to meet the requested 1.5 lb/TBtu mercury emission limit as measured by the MEMS. In August 2008, additional testing using coal more representative of normal operations was performed. This testing also showed that use of KNX (300 ppm) in conjunction with activated carbon injection (2 to 4 lb/Macf) can meet a 1.5 lb/TBtu mercury emission limit as measured by an MEMS.

This full-scale test included two days of testing in late July with poor-quality coal and two additional days in early August with normal coal. All testing was performed with activated carbon and oxidizing agent injection. KNX was applied at the coal feeders, and activated carbon was injected upstream of the multi-cyclone. Sampling for Ontario-Hydro testing was performed between the multi-cyclone outlet and the wet scrubber, and at the stack. Method 5 particulate testing and CMMS measurements were used to measure concentrations at the stack.

Particulate testing was performed to estimate the increase in PM and PM_{10} emissions. It is expected that only filterable PM and PM_{10} emissions would be affected by the injection of activated carbon into the exhaust gas stream.

Following are the results of the July-August 2008 EES testing performed at MDU:

- The measured PM_{10} emissions increase was acceptable at and below an activated carbon injection rate of 3 lb/Macf,
- The total percent mercury reductions observed using the MEMS during the testing were as follows:
    - 34% reduction using brominated activated carbon alone at an injection rate of 2 lb/Macf,
    - 55% using KNX alone at an injection rate of 300 ppm, and
    - 91% using a combination of both activated carbon and KNX technologies,

- The use of KNX at high dosages temporarily will be beneficial when a coal is encountered with higher than normal mercury content, enabling precise and instant control for mercury spikes.

Ontario-Hydro mercury testing was performed at both the inlet and the outlet to the wet scrubber to evaluate the mercury control efficiency of the unit and to determine if mercury "re-emissions" were occurring. The Ontario-Hydro testing was also conducted to verify the vapor phase mercury concentrations measured by the CMMS. When the CMMS measured less than 1.5 lb/TBtu, the Ontario-Hydro testing results also showed comparable results, verifying the results measured by the CMMS.

As testing progressed, lower mercury levels were observed at fixed injection rates. This systemic conditioning phenomenon was observed throughout the testing. Near the conclusion of the final test run, a mercury emission rate of less than 0.5 lb/TBtu was recorded by the CMMS. Based upon these observations, MDU projected that by optimizing injection rates it will achieve the requested mercury emission limit of 1.5 lb/TBtu with the proposed oxidizing agent and activated carbon injection technologies.

The Ontario-Hydro testing showed some particulate bound mercury was being emitted when testing the PAC and KNX injection technology. Even though compliance was demonstrated with the requested permit limit during this testing using the CMMS, when including the particulate bound mercury results with the CMMS results, compliance with the limit came into question. MDU indicated that it can effectively minimize particulate-bound mercury emissions through system optimizations, as discussed above, and thereby meet the requested permit limit.

D. Selected Technology

Based upon the results of multiple tests, MDU projected that installation of an oxidizing agent injection system in conjunction with an activated carbon injection system will result in compliance with the requested 1.5 lb/TBtu mercury emission limit, as measured by the installed CMMS. The following table is a summary of the mercury control technologies that were tested at MDU and the results of the testing.

Testing Conducted at L&C Station	Oxidizing Agent	Scrubber Additive	Sorbent	Control Efficiency	Projected to Achieve Compliance with the 1.5 lb/TBtu Mercury Emission Limit?
June-July 2007 EERC Testing	SEA2	None	Activated Carbon	92.4%	Yes
June 2008 EES Testing	KNX	Proprietary	None	78%	Inconclusive
July-August 2008 EES Testing	KNX	None	Activated Carbon	91%	Yes

The annualized cost of installing an oxidizing agent injection system and a PAC injection system is estimated to be $0.70 per month per customer on MDU's integrated system. For reference, the Montana Board of Environmental Review's response to comments related to Economic Impacts to Ratepayers" noted that the Northeast States for Coordinated Air Use Management (NESCAUM) estimated that mercury controls more stringent than those required to comply with CAMR (based on more stringent rules promulgated in that region) would result in a cost to the average ratepayer of approximately $0.70 per month.

IV. Emission Inventory

Boiler (Unit 1) Maximum Capacity:	600 MMBtu/hr	(company information)
Emission Rate:	1.5 lb/TBtu	(permit limit)
Hours of Operation:	8760 hr/year	

Mercury Emissions: 600 MMBtu/hr * 1 TBtu/10^6 MMBtu * 1.5 lb/TBtu * 8760 hr/yr = 7.88 lb/yr

V. Existing Air Quality

The facility is located in the SW 1/4 of Section 9, Township 22 N, Range 59 E in Richland County, Montana. The air quality of this area is classified as either Better than National Standards or unclassifiable/attainment for the National Ambient Air Quality Standards (NAAQS) for criteria pollutants.

VI. Ambient Air Impact Analysis

The Department determined, based on ambient air modeling, that the impacts from this permitting action will be minor. The Department believes it will not cause or contribute to a violation of any ambient air quality standard.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

YES	NO	
X		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	X	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	X	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	X	4. Does the action deprive the owner of all economically viable uses of the property?
	X	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	X	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	X	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	X	7a. Is the impact of government action direct, peculiar, and significant?
	X	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	X	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	X	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
P.O. Box 200901, Helena, Montana 59620
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DRAFT ENVIRONMENTAL ASSESSMENT (EA)

Issued To: Montana Dakota Utilities Co. Lewis and Clark Station

Air Quality Permit Number: 0691-00

Preliminary Determination Issued: 1/05/09
Department Decision Issued:
Permit Final:

1. *Legal Description of Site*: The MDU facility is located in the SW 1/4 of Section 9, Township 22 N, Range 59 E in Richland County, Montana.

2. *Description of Project*: MDU is proposing to install and operate a mercury emission control system consisting of an OAI system to be operated in conjunction with an ACI system and an MEMS.

3. *Objectives of Project*: The project will reduce current mercury emission levels to a maximum of 1.5 pounds per trillion British thermal units (lb/TBtu), calculated as a rolling 12-month average and will fulfill requirements of ARM 17.8.771 with respect to applying for a permit to include the applicable mercury emission standard and control strategy requirements.

4. *Alternatives Considered*: In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because MDU demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a mercury control technology analysis, would be included in Permit #0691-00.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			X			Yes
B	Water Quality, Quantity, and Distribution			X			Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity, and Quality			X			Yes
E	Aesthetics			X			Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resource of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites			X			Yes
J	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

Any impacts resulting from the proposed project to terrestrial and aquatic life and habitats would be minor because all proposed activities would take place within the defined MDU property boundary, an existing industrial site. Further, minor impact to the surrounding area from the air emissions (see Section VI of the permit analysis) would be realized due to dispersion of pollutants.

Terrestrials (such as deer, antelope, rodents, and insects) would use the general area of the facility. The area around the facility would be fenced to limit access to the facility. The fencing would likely not restrict access from all animals that frequent the area, but it may discourage some animals from entering the facility property. Therefore, any impacts to terrestrial and aquatic life and habits would have minor and typical impacts.

B. Water Quality, Quantity and Distribution

Any impacts resulting from the proposed project to water quality, quantity, and distribution would be minor because all proposed activities would take place within the defined MDU property boundary, an existing industrial site. Further, minor impact to the surrounding area from the air emissions (see Section VI of the permit analysis) would be realized due to dispersion of pollutants.

Overall, any impacts to water quality, quantity, and distribution from MDUs proposed permit action, would be minor.

C. Geology and Soil Quality, Stability and Moisture

Any impacts resulting from the proposed project to geology and soil quality, stability, and moisture would be minor because all proposed activities with respect to limits and practices associated with limiting mercury emissions would take place within the defined MDU property boundary, an existing industrial site. Further, minor impact to the surrounding area from the air emissions (see Section VI of the permit analysis) would be realized due to dispersion of pollutants.

D. Vegetation Cover, Quantity, and Quality

Any impacts resulting from the proposed project to vegetation cover, quantity, and quality would be minor because all proposed activities with respect to limits and practices associated with the proposed permit action would take place within the defined MDU property boundary, an existing industrial site. Further, minor impact to the surrounding area from the air emissions (see Section VI of the permit analysis) would be realized due to dispersion of pollutants.

E. Aesthetics

Minor impacts to the aesthetic nature of the area would result from the proposed MDU permit action because all proposed activities would take place within the defined MDU property boundary, an existing industrial site. Any changes in operational practices to minimize mercury emissions may be visible from locations around the MDU site. However, the MDU site is a previously disturbed industrial location; any aesthetic impacts would be minor and consistent with current industrial land use of the area.

Overall, any impacts to the aesthetic nature of the project area from MDU's proposed permit action, including construction activities and normal operations resulting in air emissions and deposition of air emissions would be minor.

F. Air Quality

The air quality impacts from the current permit action would be minor because Permit #0691-00 would include conditions limiting emissions of air pollution from the source, specifically by establishing a mercury emissions limit and requiring specific mercury emission control technology.

Overall, any impacts to the air quality of the project area from MDU's proposed permit action, including construction activities, normal operations resulting in air emissions, and deposition of air emissions would be minor and in compliance with all applicable MAAQS and NAAQS.

G. Unique Endangered, Fragile, or Limited Environmental Resources

The Department contacted the Montana Natural Heritage Program (MNHP) in an effort to identify any species of special concern associated with the proposed site location. Search results concluded there are 13 such environmental resources in the area. Area in this case is defined by the township and range of the proposed site, with an additional one-mile buffer. The species of special concern identified by MNHP include the *Sterna antillarum* (Least Tern), *Melanerpes erythrocephalus* (Red-headed Woodpecker), *Tyrannus vociferans* (Cassin's Kingbird), *Scaphirhyncus albus* (Pallid Sturgeon), *Polyodon spathula* (Paddlefish), *Macrhybopsis gelida* (Sturgeon Chub), *Machybopsis meeki* (Sicklefin Chub), *Cycleptus elongates* (Blue Sucker), *Sander Canadensis* (Sauger), *Corynorhinus townsendii* (Townsend's Big-eared Bat), *Zapus hudsonius* (Meadow Jumping Mouse), *Apalone spinifera* (Spiny Softshell), and Lobelia spicata (Pale-spiked Lobelia).

The MDU site has historically been used for industrial purposes. Any changes in operation associated with minimizing mercury emissions would take place within the MDU site. Because industrial operations have been ongoing within the existing MDU property boundary for an extended period of time (exceeding 50 years) and potential permitted emissions from MDU show compliance with all applicable air quality standards, it is unlikely that any of these species of special concern would be affected by the proposed project. Overall, any impacts to any unique endangered, fragile, or limited environmental resources would be minor.

H. Demands on Environmental Resource of Water, Air and Energy

Demands on environmental resources of water, air, and energy would be minor. As previously discussed, the proposed permit action would establish a limit for allowable air emissions of mercury and mercury control practices.

Therefore, any impacts to air resources in the area would be minor and would be in compliance with applicable standards. Any impacts to the local air resource would be minor as demonstrated through the ambient air quality impact analysis conducted for the proposed permit modification.

Regarding impacts to the environmental resource of water, this permit action does not include any increase in the demand for water. Therefore, any impacts to the demand for water resources in the affected area associated with MDU operations has been determined to be minor.

With respect to energy, the permit action would not change, in general, the overall amount of power used or produced.

Overall, any impacts to the demands on the environmental resources of water, air, and energy from MDU's proposed permit action would be minor.

I. Historical and Archaeological Sites

In an effort to identify any historical and archaeological sites near the proposed project area, the Department contacted the Montana Historical Society, State Historic Preservation Office (SHPO). According to SHPO, the absence of recorded cultural/historical properties in the search locale may be due to a lack of previous inventory. SHPO indicated there was a low likelihood cultural properties would be impacted and did not feel a recommendation for a cultural resource inventory was warranted. The Department determined that due to the previous industrial disturbance in the area (the area is an active industrial site) and the small amount of land disturbance that may be required for the proposed permit action, it is unlikely that any undisturbed existing historical or cultural resource exists in the area and if these resources did exist, any impacts would be minor due to previous industrial disturbance in the area.

J. Cumulative and Secondary Impacts

Overall, any cumulative and secondary impacts from the proposed permit modification on the physical and biological resources of the human environment in the immediate area would be minor due to the fact that the predominant use of the surrounding area would not change as a result of the proposed project. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #0691-00.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				X		Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production				X		Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities			X			Yes
G	Quantity and Distribution of Employment				X		Yes
H	Distribution of Population				X		Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity			X			Yes
K	Locally Adopted Environmental Plans and Goals				X		Yes
L	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores
B. Cultural Uniqueness and Diversity

The proposed permit modification would not cause a disruption to any native or traditional lifestyles or communities (social structures or mores) or impact the cultural uniqueness and diversity of the area because the current permit action would not change the current industrial nature of the MDU operation or the overall industrial nature of the area of operation. The predominant use of the surrounding area would not change as a result of the current permit action. In addition, the overall industrial nature of the surrounding area, as a whole, would not be altered by the proposed MDU permit action.

C. Local and State Tax Base and Tax Revenue

Any impacts to the local and state tax base and tax revenue would be minor because MDU would remain responsible for all appropriate state and county taxes imposed upon the business operation. In addition, MDU employees would continue to add to the overall income base of the area.

D. Agricultural or Industrial Production

The current permit action would not displace or otherwise affect any agricultural land or practices since MDU operates on an existing industrial site.

E. Human Health

There would be minor potential effects on human health due to limiting mercury air emissions from the operation of Unit 1. In addition, Permit #0691-00 would include conditions to ensure that the facility would be operated in compliance with all applicable rules and standards. These rules and standards are designed to be protective of human health.

As detailed in Section 7.F of this EA, MDU would comply with all applicable ambient air quality standards thereby protecting human health. Overall, the Department determined, based on the ambient air impact analysis that any impact to public health would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

The proposed permit action and overall MDU operations would not affect access to any recreational or wilderness activities in the area. MDU would continue to be located at the existing site. The area is comprised of private property with no public access and would continue in this state after issuance of the permit.

G. Quantity and Distribution of Employment
H. Distribution of Population

The current permit action would result in no impacts to the quantity and distribution of employment in the area and/or the distribution of population in the area because the project would not require any additional employees.

I. Demands for Government Services

Demands on government services from the proposed permit modification would be minor because MDU would be required to procure the appropriate permits (including a state air quality permit) and any permits for the associated activities of the project. Further, compliance verification with those permits would also require minor services from the government.

As the MDU site is within an existing industrial location, employee water and sewage disposal facilities would continue to be connected to existing water and sewer sources. Further, all process water needs for the facility operations would remain unchanged as a result of the current permit action. All spent water (waste-water) would continue to be discharged to an evaporation pond to be located on site and would therefore not require the use of any county or state services, including permitting. Overall, any demands on government services resulting from the proposed permit modification would be minor.

J. Industrial and Commercial Activity

The current permit action would change various aspects of the previous MDU operations, specifically related to minimizing mercury emissions associated with the operation of Unit 1, but would not result in an overall change in facility purpose; therefore, the proposed permit modification would not impact any industrial or commercial activity in the area.

K. Locally Adopted Environmental Plans and Goals

The current permit action would not contribute to the nonattainment status of any surrounding area. The Department is unaware of any other locally adopted Environmental plans or goals. The state air quality standards would protect air quality at the proposed site and the environment surrounding the site.

L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from the proposed permit modification on the economic and social resources of the human environment in the immediate area would be minor due to the fact that the predominant use of the surrounding area would not change as a result of the proposed project. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #0691-00.

Recommendation: No Environmental Impact Statement (EIS) is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permitting action establishes a mercury emission limit and associated operating requirements for the boiler in order to comply with ARM 17.8.771. Permit #0691-00 includes conditions and limitations to ensure the facility will operate in compliance with all applicable rules and regulations. In addition, there are no significant impacts associated with this proposal.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

Individuals or groups contributing to this EA: Department of Environmental Quality – Air Resources Management Bureau, Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

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